Remarks/Arguments

The present remarks are essentially a summary of the Examiner's rejection including comments where the applicant may respectfully indicate a different opinion relative to certain aspects of the rejection. Claims 35-68 are pending and claims 41, 46, 49, 50, and 61 have been amended. Support for the amendments is found in the specification, claims, and drawings as originally filed. No new matter has been added.

Claim Objections

Claims 41, 44, 49-54, and 61 are objected to for various informalities. The claims have been amended as suggested by the Examiner. Withdrawal of the objection is respectfully requested

Rejections under 35 U.S.C. § 112, first paragraph

Claims 35-67 are rejected for failing to comply with the written description requirement. The Examiner asserts that the limitation that each of the filters and each of the etalons are adjustable independent of the adjustment of another filter or etalon of a detector of the plurality of detectors is new matter because it was not described in the specification. Applicants respectfully traverse the rejection. Support for the added claim language is found in the original claims, for example, claims 13, 14, and 24-26. Reconsideration and withdrawal of the rejection are respectfully requested.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 46-48 are rejected as being indefinite because claim 46 does not contain antecedent basis for "the second wafer" in line 1. Claim 46 has been amended to provide the necessary antecedent basis.

Rejections under 35 U.S.C. §§ 102(b), 102(e)

Claims 35-37, 39-50, 52-56, 59-62, 64-68 are rejected as being clearly anticipated by Cole et al. (US 5,550,373). Applicants respectfully traverse the rejection.

The Examiner asserts that Cole et al. disclose an adaptive sensor and means for detecting light using the adaptive sensor where the sensor comprises a plurality of detectors (14) and a plurality of adjustable filters (74) proximate to the plurality of detectors (14) (Figure 4). The Examiner also asserts that Cole discloses an array of detectors (14), an array of tunable etalons, where each talon is independently tunable to provide narrow and broad band transmittance of light to a detector of the array (14). However, the Examiner has not indicated where in Cole such a teaching is found. Applicants submit that Cole et al. do not appear to teach a sensor having a plurality of detectors where each detector includes an adjustable filter and each adjustable filter is adjustable <u>independent</u> of an adjustment of another filter of a detector of the plurality of detectors, as is recited in independent claim 35.

There may be a plurality of Fabry-Perot cavities that act as filters for the respective detectors in Cole et al. The cavities may be adjustable but they are adjusted together but are not individually or independently adjustable. In the

Response to Arguments section of the Office Action, the Examiner asserts that the adaptive sensor disclosed in the present Application does not contain an adjustable filter or etalon that is adjustable independently of any other filters. Applicants respectfully disagree. As stated above in the response to the rejection under 35 U.S.C. § 112, first paragraph, the added element is disclosed in the specification as originally filed in, for example, claims 13, 14, and 24-26. Applicants submit that the Examiner recognized this element in the original claims as evidenced by the Examiner's statement in the previous Office Action:

> Regarding claims 24, 25, 26 Cole discloses an array of detectors (14); an array of tunable etalons, where each etalon is independently tunable to provide a narrow and broad band transmittance of light to a detector of the array (14).

See page 3, lines 4-6 of the Office Action mailed December 14, 2005. The Application as originally filed thus does disclose the elements of claims 35-68.

The Examiner then asserts that Cole clearly discloses in Column 3, lines 52-64 that each individual filter can be tuned to detect a variety of radiation on the respective detector, and that since the tuning is done by changing the distance between the mirrors, and since each filter contains its own mirror pair, it follows that each filter can be independently adjusted irrespective of the adjustment of any other filter in the arrangement. Applicants respectfully disagree.

In Cole et al., such as Figure 4, there may be a plurality of cavities 74 with mirrors 76 and 78 that might have different

distance adjustments relative to each other, but the tuning or the adjustment of the mirrors is done simultaneously for all the filters or cavities 74. Cole et al. teaches, with regard to FIG. 4, a multitude of Fabry-Perot filters 74, where each filter has a pair of mirrors 76 and 78 and the distances between mirrors 76 and 78 may be different, thus each filter 74 may have a high transmittance for different wavelength and be tuned for detecting a variety of radiation on respective detectors 14. See column 3, lines 54-64. As shown in FIG. 4 of Cole, all of the mirrors 76 are fixed to the wafer 32 and the mirrors 78 are fixed to the bridge 24. Cole et al. teach, with regard to FIG. 1, "[w]afer 32 is vacuum sealed to bolometer detector 24 pixel 14 or array of pixels 14, with a continuous support 30." See column 2, lines 21-22. Cole et al. also teach "[a]s an actuators 26 expands or shrinks, it has a cantilever effect on the supporting portion of bridge 24 since it is adhered to the surface of that portion." See column 3, lines 2-5. The device in FIG. 4 appears to operate in the same way as the devices in FIGS. 1 and 3, as evidenced by the use of reference numerals 24, 26, and 32 for the bridge, actuators, and wafer. Thus, it appears that the device in FIG. 4 operates by having the bridge 24 move relative to the wafer 32, which necessarily results in the plurality of mirrors 76 and 78 moving simultaneously. While the distance between mirrors 76 and 78 may be different for each filter 74, the mirrors 76 move together relative to mirrors 78 when the bridge 24 is moved up or down by the actuators 26. Thus, one cavity 74 may be tuned but the tuning of the remaining cavities 74 will be affected at the same time.

Independent claims 49, 55, and 60 recite a similar element of a filter that is adjustable independent of other filters. The claims are thus believed to be patentable over Cole et al. for at least the reasons set forth above. Additionally, there is no motivation for one of ordinary skill in the art to modify the device of Cole et al. to achieve the invention recited in independent claims 35, 49, 55, or 60, or the claims dependent thereon. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 35, 39-43, 49, 52, 55, 56, and 59 are rejected as being clearly anticipated by Harling et al. (US 6,222,454). Applicants respectfully traverse the rejection. The Examiner indicated that Harling et al. disclose an adaptive sensor comprising a plurality of detectors (21a, 21b) and a plurality of adjustable bandpass filters (51a, 51b) proximate to the plurality of detectors. The Examiner added that the method of detecting includes providing a detector, placing the filter proximate to the detector, adjusting the filter to a desired wavelength and directing the filter and detector toward a target. The applicant respectfully tends to disagree with the Examiner relative to the feature of adjusting the filter, post-fabrication or at least dynamically, to a desired wavelength. The temperature sensing device of Harling et al. appears to have a pair of infrared sensors (e.g., bolometers) of which one sensor is for sensing one spectral band and the other sensor is for sensing another spectral band. To attain different spectral bands of sensing, filters (51a, 51b) are used. The spectral bands of the filters appear to be set and designed at the time of fabrication of the sensing device. The elements (51a, 51b)

for the two bands may be multi-layer thin film filters either located on flat windows or on diffractive microlenses (51a', 51b'). No mechanism for tuning or adjusting the bands after the device is built appears to be disclosed in Harling et al. The bands may be selected for the device but are not tuned or adjusted after fabrication or installation. The bands may be selected according to their emissitivities. The adjustment relates to focusing of the radiation even though the focusing lens may also be a filter, such as the microlenses (51a', 51b'). The calibration of the device involves obtaining the gain and offset value of the detectors, through measuring two different blackbody temperatures. Another approach may be to compare an uncorrected ratio with a look-up table constructed from a series of measurements.

The Examiner has not addressed the above arguments, which were made in the previous response. If this rejection is maintained, Applicants respectfully request the Examiner provide a detailed response to the arguments.

Rejections under 35 U.S.C. § 103(a)

Claims 38, 51, 57, 58, and 63 are rejected as being unpatentable over Cole. The Examiner acknowledges that Cole fails to use electrostatic or capacitive actuators in the detecting system. The Examiner asserts that it would have been obvious to one of ordinary skill in the art to substitute one for the other since both types of actuators are well known and frequently used and substituted for one another for their obvious particulate advantage. Applicants respectfully traverse the rejection.

For at least the reasons set forth above, Cole does not appear to teach or suggest the basic elements of independent claims 35, 49, 55, and 60, from which claims 38, 51, 57, 58, and 63 depend. Further, there is no motivation for modifying the device of Cole to achieve the claimed invention.

Cole et al. promote and use piezoelectric (PZT) actuators which of course may have actuator electrodes 56 and capacitive sense electrodes 28 for sensing distances associated with PZT actuators. Cole et al. indicate that piezoelectric actuators are fast in comparison to other types of actuators such as thermal bimorphs. Cole et al. say that, unlike capacitors, PZT actuators 26 leave the majority of the real estate or area of the chip available for IR transmission. Cole et al. add that PZT forces and displacements are linear with voltage, unlike capacitance actuation in which the forces diminish inversely with spacing. Cole et al. thus appear to teach away from the use of electrostatic or capacitative actuation. (Col. 2, line 60 to col. 3, line 25.)

Reconsideration and allowability of the pending claims are very respectfully requested.

Respectfully submitted,

Dated: 06/09/06

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